

CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION **DATE**
May 2009

APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4			R-1 ITEM NOMENCLATURE 0603512N/CARRIER SYSTEMS DEVELOPMENT				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	85.742	147.205	173.594				
2208 / CVN 21	44.788	56.597	57.542				
3216 / Tactical Support Center-Integration	0.000	0.000	5.154				
3217 / KU-Band Common Data Link	0.000	0.000	14.562				
4004 / EMALS	35.751	61.498	94.535				
4005 / SMART CARRIER	1.730	1.585	1.801				
9999 / CONGRESSIONAL ADDS	3.473	27.525	0.000				

A. MISSION DESCRIPTION:

This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. The program includes:

- (U)(2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers.

- (U)(3216) - Development of block upgrades of the MH-60R sensor suite into the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC). The CV-TSC provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti Submarine Warfare (ASW). Through the integration of off-board sensors and signal, data and display processors, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and Surface Warfare (SUW) assets (S-3B until retirement, SH-60F helicopter). This project provides the development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of fleet introduction and shipboard integration of the MH-60R Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and BAMS aircraft.

- (U)(3217) - Development of multi-mission shipboard high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and BAMS. This effort will provide the Carrier with the capability to support multiple simultaneous aircraft on different missions, and completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders.

- (U)(4004) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch

CLASSIFICATION:		UNCLASSIFIED
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4	R-1 ITEM NOMENCLATURE 0603512N/CARRIER SYSTEMS DEVELOPMENT	
<p>System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload.</p> <p>- (U)(4005) - The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC).</p> <p>- (U)(9B59A) - QuIPS provides an automated data fusion system to detect, track, classify, and neutralize threats in the near shore environment. QuIPS is state-of-the-art in algorithm development in non plane wave acoustic beamforming to detect and track surface ship and submerged contacts in very shallow water using matched phase matched field processing, as well as normal plane wave beamformers. Funding provided for the integration of QuIPS with CV-TSC version 6.0 software architecture and development of a portable (2-man lift) hardware system to host the integrated software.</p> <p>- (U)(9B57A) - Funding provided to enable the proliferation of non-tactical technologies, solution, applications, and systems from submarine nuclear propulsion plants. This effort will ensure that open architecture, open standards software and network design is used in carriers as well as submarines to ensure on life-cycle supportable system is fielded. Efforts include PPKM pilot installation and ongoing shipboard maintenance solution requirements and design work.</p> <p>- (U)(9B58A) - Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in NJ. Various coupons and coatings have been exposed up to 7 months now and will continue to be evaluated over the next three years of exposure under simulated flight deck conditions. The funding will also be used to initiate phase 2 study into the development of a corrosion inhibitor addition to the armature cooling to extend the armatures life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled under the unique conditions of the EMALS for the in-service support of the EMALS system.</p> <p>- (U) (9D23A) - Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the Undersea Warfare Decision Support System (USW-DSS - AN/UYQ-100), has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks and to provide military commanders with the CTP they need to support critical battle-space decisions. The NSF for Puget Sound Port Security (PSPS) is being developed as an application within the Service Oriented Architecture (SOA) of USW-DSS.</p> <p>- (U) (9D24A) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved</p>		

CLASSIFICATION:**UNCLASSIFIED****EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)**

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY

RD TEN/BA 4

R-1 ITEM NOMENCLATURE

0603512N/CARRIER SYSTEMS DEVELOPMENT

reliability and maintainability, increased operational availability and reduced operator and maintainer workload.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	86.544	120.511	72.135
FY10 President's Budget	85.742	147.205	173.594
Total Adjustments	-0.802	26.694	101.459
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	-0.001	-0.401	0.000
SBIR/STTR/FTT Assessment	-0.802	0.000	0.000
Program Adjustments	0.001	27.600	102.237
Rate/Misc Adjustments	0.000	-0.505	-0.778
Total	-0.802	26.694	101.459

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 2208/CVN 21		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	44.788	56.597	57.542				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>This project provides for the development of aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).</p>							

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 2208/CVN 21	
B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.805	0.000	0.000
RDT&E Articles Quantity	0	0	0
- (U) Non-Nuclear Propulsion Plant Development -			
(FY08) Complete MTG shock qualification; transport/disposition MTG generator to designated storage; and transport/disposition MTG turbine.			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	39.328	45.822	50.767
RDT&E Articles Quantity	0	0	0
- (U) CVN 21 Advanced Technology Design & Development: Continue development and transition of technologies to support CVN 21 Key Performance Parameters (KPPs): maintain sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new propulsion plant and Electromagnetic Aircraft Launch System, and expand the design build approach to include the whole ship, and to improve overall performance. Technologies and design efforts include, but not limited to:			
(FY08 - FY 10) - Continue transition planning and execution, including finishing development work, certification/qualification testing, in-service testing, integrated logistics support and design integration tasks for all projects in the Critical and Non-Critical Technology portfolios. Continue identification of technology opportunities for incorporation into the CVN78. Efforts also encompass those tasks required to support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.655	10.775	6.775
RDT&E Articles Quantity	0	0	0
- (U) CVN 21 - Test & Evaluation -			
(FY08) - Commenced Developmental Test (DT) B1 test events which include an assessment of DT-A2 data results, demonstration that the CVN 78 will meet requirements, continuation of PARM interfacing, continuation of model and simulation testing, and management of Test and Evaluation (T&E) risks. Conducted an Operational Test Readiness Review (OTRR) to signal readiness to commence Operational Test (OT) B2 phase design assessments by Commander, Operational Test and Evaluation Forces (COMOPTEVFOR). Participating as a passive observer in a Joint Mission Environment Test Capability (JMETC) sponsored interoperability test event. Planning to commence Change 1 to Test and Evaluation Master Plan (TEMP) 1610, Rev B. started development of a plan/process as an alternative to fulfill the requirements of the Full Ship Shock Trial (FSST) Executing Sortie Generation Rate (SGR) Modeling and Simulation (M&S) improvements to the Virtual Carrier Model (VCVN) to support Initial Operational Test and Evaluation (IOT&E).			

CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION) DATE
May 2009

APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 2208/CVN 21
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Collaborating with the various working groups, COMOPTEVFOR, & Director, Operational Test and Evaluation (DOT&E) to ensure requirements are met for planning of the post delivery test & trials. Compiling and evaluating topside E3 risks.

(FY09) - Execute an alternative to fulfill the requirements of the Full Ship Shock Trial (FSST). Continue DT-B1 efforts to include as assessment of results that will demonstrate the CVN 78 design will meet requirements. Conclude DT-B1 in late FY 09 with a test report. Commence DT planning on C4I equipment and sensors to define and implement interoperability testing. Conduct OTRR to signal readiness to commence OT-B3 phase design assessments by COMOPTEVFOR. Commence planning for DT-B2i Net-Ready/Interoperability Event. Continue planning/execution of SGR M&S improvements to the VCVN Model. Continue planning of post delivery test and trials with various working groups, COMOPTEVFOR, and DOT&E to ensure requirements are met. Finalize Change 1 to TEMP 1610, Rev B. Continue to evaluate Topside E2 risks.

(FY10) - Commence OT-B3 and continue DT-B2 T&E planning efforts. Plan/execute alternative to fulfill the requirements of the FSST. Plan for and execute DT-B2i Net-Ready/Interoperability Event. Commence DT on C4I equipment and sensors to define and implement interoperability testing to support JITC certification. Continue collaboration with the various working groups, COMOPTEVFOR, & Director, Operational Test and Evaluation (DOT&E) to ensure requirements are met for planning of the post delivery test & trials. Continue planning/execution of SGR M&S improvements to the VCVN Model to ensure COMOPTEVFOR IOT&E requirements are met. Continue E3 Topside risk evaluation.

C. OTHER PROGRAM FUNDING SUMMARY:

* Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0603570N (PU 2692).
 * Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0604567N (PU 3108, 3179, 4007, 4008, 9C20A).

Line Item No. and Name	FY 2008	FY 2009	FY 2010					
BLI 200100 Carrier Replacement Program	3,145.026	3,915.642	1,223.701					

Related RDTEN: PE 0604567N Ship Contract Design, Live Fire T&E, PE 0603570N Adv. Nuclear Power Systems

D. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 2208/CVN 21	
E. MAJOR PERFORMERS: Northrop Grumman Ship Building-Newport News, Newport News, VA, Design / Component Development / Construction Naval Surface Warfare Center, Carderock, MD, Technology Design & Development Naval Surface Warfare Center, Dahlgren, VA, Technology Design & Development			

CLASSIFICATION:		UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE		
									May 2009		
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME					PROJECT NUMBER AND NAME				
RD TEN/BA 4		0603512N/CARRIER SYSTEMS DEVELOPMENT					2208/CVN 21				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		
Propulsion Plant Development	SS,CPFF	BETTIS, PA	71.627			0.000		0.000			
	CPFF	NGSB-NN	164.409			0.000		0.000			
	Various	Miscellaneous	10.562			0.000		0.000			
	WR	NSWC Carderock	0.050			0.000		0.000			
Advanced Design & Development	CPAF	NGSB-NN	120.546			13.528	NOV-08	16.596	NOV-09		
	WR	NSWC Carderock	70.183			0.976	OCT-08	0.500	OCT-09		
	CPFF	SAIC	48.070			1.000	DEC-08	2.243	DEC-09		
	WR	NAWCAD Pax River	30.145			9.060	OCT-08	9.691	OCT-09		
	WR	NAWC Lakehurst	7.539			0.650	OCT-08	0.000	OCT-09		
	WR	NSWC Dahlgren	14.274			4.875	OCT-08	5.095	OCT-09		
	CPAF	Raytheon	14.827			5.828	DEC-08	5.978	DEC-09		
	WR	NSWC Port Hueneme	5.538			0.000	OCT-08	0.000	OCT-09		
	WR	SPAWAR	7.811			0.871	OCT-08	1.200	OCT-09		
	CPFF	NAVSEA SEAPORT	20.276			4.374	DEC-08	4.957	DEC-09		
	Various	Miscellaneous	36.436			4.660	OCT-08	4.637	DEC-09		
Subtotal Product Development			622.293			45.822		50.897			
Remarks:											
Developmental Test & Evaluation	CPAF	NGSB-NN	4.634			3.612	NOV-08	1.348	NOV-09		
	WR	NAWCAD Pax River	9.821			1.360	OCT-08	2.087	OCT-09		
	WR	NSWC Dahlgren	2.434			0.380	OCT-08	0.230	OCT-09		
	WR	NSWC Carderock	3.602			2.695	OCT-08	0.500	OCT-09		
	WR	SPAWAR	2.131			0.730	OCT-08	0.550	OCT-09		
	CPFF	NAVSEA SEAPORT	0.075			0.000		0.000			
	CPAF	Raytheon	0.735			0.050	DEC-08	0.075	DEC-09		
	Various	Miscellaneous	4.408			1.070	OCT-08	0.940	OCT-09		
Operational Test & Evaluation	WR	COMOPTEVFOR	2.793			0.878	OCT-08	0.915	OCT-09		
Subtotal Test and Evaluation			30.633			10.775		6.645			
Remarks:											

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EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT					PROJECT NUMBER AND NAME 2208/CVN 21					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
Total Cost			652.926			56.597		57.542				

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 2208/CVN 21		
Schedule Profile		FY 2008	FY 2009	FY 2010			
CVN 78 DAB PR		4Q					
Developmental Tests DT-B1		1-4Q	1-4Q				
Operational Tests OT-B2		1-4Q	1-2Q				
EMALS TRR 1 (HALT/HCT)		3Q					
AAG TRR 1 (IT)				1Q			
CVN 78 Construction Contract Award		4Q					
CVN 78 SCN Full Funding		1Q					
Developmental Tests DT-B2			4Q	1-4Q			
Operational Tests OT-B3				1-4Q			
EMALS TRR 2 (DT/OA)			3Q				
EMALS LRIP			4Q	1Q			
Operational Test Readiness Reviews		2Q		1Q			
Operational Assessments			2-3Q				
CVN 79 CP Contract Award			2Q				

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 3216/Tactical Support Center-Integration		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	5.154				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>The CV-TSC program provides increased situational awareness to the CSG in support of force protection, primarily in the area of ASW. Through the integration of off-board sensors and signal, data and display processors, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and SUW assets (S-3B until retirement, SH-60F helicopter). This project provides the design, development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of fleet introduction and shipboard integration of the MH-60R Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and BAMS aircraft.</p>							

CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION

DATE
May 2009

APPROPRIATION/BUDGET ACTIVITY PROGRAM ELEMENT NUMBER AND NAME PROJECT NUMBER AND NAME
RD TEN/BA 4 **0603512N/CARRIER SYSTEMS DEVELOPMENT** **3216/Tactical Support Center-Integration**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
MH-60R Integration Development for CV-TSC	0.000	0.000	5.154
RDT&E Articles Quantity	0	0	0

FY10: Design and develop the AN/SQQ-34 upgrade to support the MH-60R Multi Mission Helicopter.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
OPN/BLI 2176/USW Support Equipment (Grand Total BLI)	14.805	15.532	38.705						
OPN/BLI 2176/USW Support Equipment (Related N88 MH-60R Portion)	0.000	0.000	17.966						

D. ACQUISITION STRATEGY:

The CV-TSC will be upgraded to support full deployments of KU-Band equipped MH-60R aircraft. The CV-TSC development activity is a government field activity, Naval Undersea Warfare Center, Division Keyport. Hardware procurements and back fit of the CV-TSC will use the AN/SQQ-34C as a baseline with additional hardware necessary for MH-60R support. Hardware shall be procured via a Request For Proposal (RFP) with industry. To the maximum extent possible, CV-TSC will use enterprise hardware initiatives being developed by the Navy in support of DDG-1000 and Aegis Modernization.

E. MAJOR PERFORMERS:

NAVSEA, Keyport, WA - Non/Recurring Engineering, Software Development

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT					PROJECT NUMBER AND NAME 3216/Tactical Support Center-Integration					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
Non-Recurring Engineering	WR	NAVSEA/Keyport, WA	0.000			0.000		3.500	OCT-09			
System Eng / S/W Development	WR	NAVSEA/Keyport, WA	0.000			0.000		1.654	OCT-09			
Subtotal Product Development			0.000			0.000		5.154				
Total Cost			0.000			0.000		5.154				

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EXHIBIT R-4, SCHEDULE PROFILE

DATE
May 2009

APPROPRIATION/BUDGET ACTIVITY
RD TEN/BA 4

PROGRAM ELEMENT NUMBER AND NAME
0603512N/CARRIER SYSTEMS DEVELOPMENT

PROJECT NUMBER AND NAME
3216/Tactical Support Center-Integration

Fiscal Year	2008				2009				2010																			
	1	2	3	4	1	2	3	4	1	2	3	4																
Increment Development (Initial MH-60R Capabilities)																												
Verification and Validation (post FY10)																												
Combat System Certification (post FY10)																												
Increment Development (MH-60R Block Upgrades) (post FY10)																												
Verification and Validation (post FY10)																												
Combat System Certification (post FY10)																												
OPEVAL (post FY10)																												
Fielding Plan (post FY10)																												

Note - Systems will be fielded with hardware and baseline AN/SQQ-34(V) software required to support initial MH-60R deployments. As new software is developed and certified, it will be delivered to the CVN as a software-only change.

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4			PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 3216/Tactical Support Center-Integration	
Schedule Profile			FY 2008	FY 2009	FY 2010		
Initial MH-60R Capabilities Development					1Q-4Q		

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APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 3217/KU-Band Common Data Link		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	14.562				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>Develops a multi-mission, shipboard, high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and BAMS. This effort will provide the Carrier with the capability to support multiple simultaneous aircraft on different missions, also completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders. This development effort will support the initial deployments of the Ku-Band equipped MH-60R Air wing for new construction Carriers, RCOH Carriers, and NIMITZ class back fits.</p>							

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:									
	FY 2008	FY 2009	FY 2010						
Common Data Link Development	0.000	0.000	14.562						
RDT&E Articles Quantity	0	0	0						
FY10 - Development of Ku-Band data link between the embarked air assets and the Carrier combat system.									
C. OTHER PROGRAM FUNDING SUMMARY:									
Line Item No. and Name	FY 2008	FY 2009	FY 2010						
OPN/BLI 2176/USW Support Equipment (Grand Total BLI)	14.805	15.532	38.705						
OPN/BLI 2176/USW Support Equipment (Related N88 CDL Portion)	0.000	0.000	6.151						
D. ACQUISITION STRATEGY:									
The KU-Band Common Data Link will be upgraded on the Carrier to support full deployments of KU-Band equipped MH-60R aircraft. The required development for this effort will be completed in FY10. Procurements and back fit of the Ku-Band capability will be fielded in beginning after FY10. PEO C4I shall develop the additional capabilities by implementing an Engineering Change Proposal (ECP) to the AN/USQ-167 Communications Data Link System (CDLS). ECP implementation shall be procured via a Request For Proposal (RFP) with industry. This would ensure the most efficient and cost effective implementation for Navy.									
E. MAJOR PERFORMERS:									
Program Executive Office Command, Control, Communications, Computers & Intelligence (PEO C4I) SPAWAR Systems Center, San Diego, CA Technology Unlimited Group (TUG), San Diego, CA Industry Hardware Provider (TBD)									

CLASSIFICATION:		UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT					PROJECT NUMBER AND NAME 3217/KU-Band Common Data Link				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		
NonRecurring Engineering	CPFF	TBD	0.000			0.000		5.228	OCT-09		
Recurring Engineering	FFP	TBD	0.000			0.000		2.574	OCT-09		
System Eng / Software Development	CPFF	Technology Unlimited Group, CA	0.000			0.000		4.353	OCT-09		
Integrated Logistics Support	TBD	SPAWAR Systems Center, CA	0.000			0.000		0.550	OCT-09		
Integration and Test	TBD	SPAWAR Systems Center, CA	0.000			0.000		1.086	OCT-09		
Subtotal Product Development			0.000			0.000		13.791			
Remarks:											
Test and Certification	TBD	SPAWAR Systems Center, San Diego CA	0.000			0.000		0.771	OCT-09		
Subtotal Test and Evaluation			0.000			0.000		0.771			
Remarks:											
Total Cost			0.000			0.000		14.562			

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY
RD TEN/BA 4

PROGRAM ELEMENT NUMBER AND NAME
0603512N/CARRIER SYSTEMS DEVELOPMENT

PROJECT NUMBER AND NAME
3217/KU-Band Common Data Link

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4																				
Contract Milestones																																
Acquisition Plan						▲																										
Source Selection Plan							▲																									
RFP Release								▲																								
Contact Award												▲																				
Acquisition Milestones																																
Software Development											▲	—	—	—	—	—																
Initial H/W Modification											▲	—	—	—	—	—																
Test & Evaluation Milestones																																
TEMP Update & Approval						▲	—	▼																								
Development Test											▲	—	—	—	—	▼																
Multiple Helo Live Test															▲	—																
Operational Test (OPTEVFOR)																▲																

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 3217/KU-Band Common Data Link		
Schedule Profile		FY 2008	FY 2009	FY 2010			
Acquisition Plan			1Q				
Source Selection Plan			2Q				
RFP Release			3Q				
Contract Award			4Q				
Software Development				1-4Q			
Initial Hardware Development				1-4Q			
Temp Update/Approval			2Q-4Q				
Development Test				1-4Q			
Operational Test (Multiple Helo Live Test)				4Q			
Operational Assessment (OPTEVFOR)				4Q			

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 4004/EMALS		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	35.751	61.498	94.535				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 and follow-on ships of the CVN 78 Class. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability, and reduced operator and maintainer workload.</p>							

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 4004/EMALS		
B. ACCOMPLISHMENTS/PLANNED PROGRAM:							
		FY 2008		FY 2009		FY 2010	
Accomplishments/Effort/Subtotal Cost		35.751		61.498		94.535	
RDT&E Articles Quantity		0		0		0	
<p>-(U) EMALS -</p> <p>FY-08: Continue System Development and Demonstration phase. Continue shipboard representative system development effort. Manufacture and installation of a shipboard representative system into the land based test facility. Initiate High Cycle and Life Testing. Continue CVN 78 integration development. Provide management, systems engineering, test, and ship integration support.</p> <p>FY-09: Continue System Development and Demonstration phase. Continue shipboard representative system development effort. Complete installation of shipboard representative system into the land based test facility and commission land based test site. Initiate System Integration and Environmental Testing and Highly Accelerated Life cycle Testing. Continue High Cycle and Life Testing. Provide management, systems engineering, test, and ship integration support.</p> <p>FY-10: Continue System Development and Demonstration phase. Continue CVN78 integration development. Provide management, systems engineering, test, and ship integration support. Continue System Integration and Environmental Testing. Complete High Cycle and Life testing and Highly Accelerated Life cycle Testing. Initiate land-based System Verification Testing.</p>							
C. OTHER PROGRAM FUNDING SUMMARY:							
* Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0603570N (PU 2692).							
* Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0604567N (PU 3108, 3179, 4007, 4008, 9C20A).							
Line Item No. and Name		FY 2008	FY 2009	FY 2010			
BLI 200100 Carrier Replacement Program		3,145.026	3,915.642	1,223.701			
<p>Related RDTEN: PE 0604567N Ship Contract Design, Live Fire T&E, PE 0603570N Adv. Nuclear Power Systems</p>							
D. ACQUISITION STRATEGY:							
<p>The CVN 78 will be the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship</p>							

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 4004/EMALS
self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.		
E. MAJOR PERFORMERS:		
General Atomics, San Diego, CA, EMALS Design and Development		
Naval Air Warfare Center, Aircraft Division, Lakehurst, NJ: EMALS Development and Test.		

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT					PROJECT NUMBER AND NAME 4004/EMALS					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date			
Aircraft Launch, Recovery & Support	CPAF	Northrop Grumman	83.352			0.000		0.000				
	CPAF	General Atomics (PDRR)	82.719			0.000		0.000				
	CPAF	General Atomics (SDD)	218.368			35.801	DEC-08	67.498	DEC-09			
	WR	NAWC Lakehurst	34.457			7.047	DEC-08	3.200	NOV-09			
	CPAF	NGSB-NN	2.536			0.000		0.000				
	Various	Miscellaneous	1.442			1.859	DEC-08	0.020	DEC-09			
	CPAF	General Atomics (SDD) - Award Fee	3.819			1.900	DEC-08	8.100	DEC-09			
Subtotal Product Development			426.693			46.607		78.818				
Remarks: A \$36.9 million FY 07 prior approval reprogramming was approved in April 2008 and is included in Total Prior Year Cost.												
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst	27.954			14.891	DEC-08	15.717	DEC-09			
Subtotal Test and Evaluation			27.954			14.891		15.717				
Remarks: .												
Total Cost			454.647			61.498		94.535				

CLASSIFICATION:

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EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY
RD TEN/BA 4

PROGRAM ELEMENT NUMBER AND NAME
0603512N/CARRIER SYSTEMS DEVELOPMENT

PROJECT NUMBER AND NAME
4004/EMALS

Fiscal Year	2008				2009				2010																			
	1	2	3	4	1	2	3	4	1	2	3	4																
Acquisition Milestones			CVN 78 DAB PR △																									
Propulsion Plant	—————																											
EMALS		TRR 1 △				TRR 2 △			LRIP △																			
Advanced Arresting Gear									TRR 1 △																			
Test & Evaluation Milestones																												
Development Test	————— DT B1												————— DT B2															
Operational Test	————— OTRR OT B2								————— OTRR OT B3																			
Operational Assessments								△																				
Contract Milestones																												
IPPD Contract																												
CP Contract																												
Construction Contract			CVN 78 Construction Contract Award △				CVN 79 CP Contract Award △																					
Full Funding (SCN)	X																											
	CVN 78																											

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 4004/EMALS		
Schedule Profile		FY 2008	FY 2009	FY 2010			
CVN 78 DAB PR		4Q					
Developmental Tests DT-B1		1-4Q	1-4Q				
Operational Tests OT-B2		1-4Q	1-2Q				
EMALS TRR 1 (HALT/HCT)		3Q					
AAG TRR 1 (IT)				1Q			
CVN 78 Construction Contract Award		4Q					
CVN 78 SCN Full Funding		1Q					
Developmental Tests DT-B2			4Q	1-4Q			
Operational Tests OT-B3				1-4Q			
EMALS TRR 2 (DT/OA)			3Q				
EMALS LRIP			4Q	1Q			
Operational Test Readiness Reviews		2Q		1Q			
Operational Assessments			2-3Q				
CVN 79 CP Contract Award			2Q				

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 4005/SMART CARRIER		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.730	1.585	1.801				
RDT&E Articles Qty	0	0	0				
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs. Initial technologies include Aviation Fuels (JP-5) Automation, the Advanced Damage Control System (ADCS), Automated Material Handling Systems, Damage Control Inventory Management and Stowage System (DCIMSS), List Control, Firemain Control, Integrated Condition Assessment System, Interior Communications/Systems Monitoring Alarm Upgrades, and the Digital Video Surveillance System. Demonstration technologies include Advanced Damage Control System (ADCS) software improvements, Electronic Valve Operator automation, Superior Sound Technology, Vibration Monitoring/Rotating Machinery Diagnostic Tools, Flat Plane Speakers, Smart Circuit Breakers, Distilling Unit Automation, Reboiler Automation, In-line Aviation Fuels Sampling, Advanced Oil Purification System, Oil Monitoring Sensors, and Voice Interactive Display. Wireless systems, smart sensors, knowledge-based systems, automated casualty control, automated technology for workload reduction, linked smart devices, common software tools for interoperability, and self-healing network are technologies being considered for future applications.</p>							

CLASSIFICATION:	UNCLASSIFIED
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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION	DATE May 2009
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APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 4005/SMART CARRIER
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B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.730	1.585	1.801
RDT&E Articles Quantity	0	0	0

(U) Smart Carrier - Fiscal Year 2008 efforts will complete ADCS software improvements for installation in USS NIMITZ (CVN68) and continue Aviation Fuels Electric Valve Operator automation, as well as initiate the development and testing of Superior Sound Technologies for shipboard announcing systems. Other initiatives include starting the Input Output Controller (IOC) replacement project; Identify, develop and test a shipboard qualified Uninterruptible Power System (UPS) to replace existing obsolete 15KVA UPS SYSTEMS meeting Mil Spec requirements; and conduct a conceptual study to improve the operational capacity of CVN68 Class 363-ton air conditioning plant. Develop a shipboard AC Plant model.

Fiscal Year 2009 efforts will complete Aviation Fuels Electric Valve Operator automation and the development/testing of Superior Sound Technologies for shipboard announcing systems for implementation in USS RONALD REAGAN (CVN76), and initiate software development of vibration monitoring/rotating machinery diagnostic tools and software development for expanded condition-based maintenance for rotating machinery.

Future efforts in Fiscal Year 2010 and beyond include reboiler automation, liquid load management, advanced fire and smoke sensors, and Integrated Condition Assessment System software improvements, all via modifications and improvements to the existing Smart Carrier hardware and software suite. Also, conduct research and development of a Smart Automated Oil Pollution Abatement (AOPA) System on board Smart Carrier CVN68 Class ships.

C. OTHER PROGRAM FUNDING SUMMARY:

* LT140 is the cost code for Smart Carrier funding in 0981 budget. "Other program funding summary" reflects LT140 only and not the entire 0981 line total.

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
098100 Items Under \$5M Smart Carrier (LT 140)	13.612	15.329	17.099						

D. ACQUISITION STRATEGY:

Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

E. MAJOR PERFORMERS:

Naval Sea Systems Command - Philadelphia (formerly Naval Surface Warfare Center, Carderock Division), Philadelphia, PA performs software development, test and evaluation, integration and program management to include training development and integrated logistics support development. Funds are typically issued in the first fiscal quarter.

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 4005/SMART CARRIER	
* Smart Carrier merges with the Aircraft Carrier Machinery Plant Upgrades procurement program beginning in FY12			

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT					PROJECT NUMBER AND NAME 4005/SMART CARRIER					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		Total Cost (\$000)	Target Value of Contract
Ship Integration	WR	NAVSEA, Phil.	0.720			0.120	NOV-08	0.125	NOV-09			
Systems Engineering	CPAF	NGNN, VA	0.205			0.000		0.000				
	Various	Miscellaneous	7.978			0.000		0.000				
Subtotal Product Development			8.903			0.120		0.125				
Remarks:												
Software Development	WR	NAVSEA, Phil.	5.030			0.565	NOV-08	0.651	NOV-09			
Training Development	WR	NAVSEA, Phil.	0.390			0.080	NOV-08	0.095	NOV-09			
Integrated Logistics Support	WR	NAVSEA, Phil	0.760			0.120	NOV-08	0.200	NOV-09			
Subtotal Development Support			6.180			0.765		0.946				
Remarks:												
Developmental Test & Evaluation	WR	NAVSEA, Phil	2.436			0.450	NOV-08	0.470	NOV-09			
Subtotal Test & Evaluation			2.436			0.450		0.470				
Remarks:												
Program Management Support	WR	Navsea, Phil.	1.500			0.250	NOV-08	0.260	NOV-09			
Subtotal Support Services			1.500			0.250		0.260				
Remarks:												
Total Cost			19.019	0.000		1.585		1.801				

CLASSIFICATION:

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EXHIBIT R-4, SCHEDULE PROFILE

DATE

May 2009

APPROPRIATION/BUDGET ACTIVITY

PROGRAM ELEMENT NUMBER AND NAME

PROJECT NUMBER AND NAME

RD TEN/BA 4

0603512N/CARRIER SYSTEMS DEVELOPMENT

4005/SMART CARRIER

	FY 2008				FY 2009				FY 2010																						
	1	2	3	4	1	2	3	4	1	2	3	4																			
Ship Control System Governor Development	██████████																														
AC Plant Model - Capacity Optimization	██████████																														
Electric Plant Monitoring Control System	██████████																														
UPS Replacements	██████████				██████████				██████████																						
ADCS Software Improvements (AFSSS & FCCS)	██████████				██████████																										
Electronic Valve Operator Automation	██████████																														
Superior Sound Technology (5MC)	██████████				██████████																										
Vibration Monitoring/Rotating Machinery Diagnostic Tools					██████████		██████████		██████████		██████████																				
Expanded Condition-Based Maintenance							██████████		██████████		██████████																				
Reboiler Automation									██████████		██████████																				
Liquid Load Management									██████████		██████████																				

CLASSIFICATION:		UNCLASSIFIED					
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 4005/SMART CARRIER		
Schedule Profile		FY 2008	FY 2009	FY 2010			
UPS Replacements		2Q	1-4Q	1Q			
Ship Control System Governor Software Development		1-4Q	1-4Q				
AC Plant Model - Capacity Optimization		1-4Q					
Electric Plant Monitoring Control System		1Q					
ADCS Software Improvements (AFSSS/FCCS) Software Development Test		1Q	1-4Q	1Q			
Electronic Valve Operator Automation Software Development		1Q					
Electronic Valve Operator Automation Software Development Test		2-4Q	1Q				
Superior Sound Technology (5MC) Development/Integration		2-4Q	1-3Q				
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development			1-4Q	1-2Q			
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Dev. Test				3-4Q			
Expanded Condition-Based Maintenance - Rotating Machinery			3-4Q	1-3Q			
Reboiler Automation SW/HW Development				1-4Q			
Liquid Load Management SW Development/Test				3-4Q			

CLASSIFICATION:		UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 9999/CONGRESSIONAL ADDS	
B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
9B59A Quiet Interlude Processing System (QuIPS)	0.774	0.000	0.000
RDT&E Articles Quantity	0	0	0
Funding provided to continue the integration of QuIPS with CV-TSC version 6.0 software architecture and develop a portable (2-man lift) hardware system to host the integrated software. Developed and integrated data fusion algorithms and software to fuse short range, relatively accurate, time dense tactical sensor ship track data with global, relatively inaccurate, time sparse national sensor ship track data. Developed and integrated data fusion algorithms and software to fuse non acoustic Latitude/Longitude vs. time tracks with acoustic sonar true bearing vs. time tracks output by most Navy sonar. There is a requirement for a portable tactical situational awareness system that can take inputs from multiple sensor types; fuse sensor detection reports, contact reports and tracks into composite tracks; display both independent contacts and composite tracks on a GIS display; and allow operator drill-down capability to underlying metadata. This portable system supports a number of mission scenarios including Anti-Terrorism, Force Protection and Expeditionary Naval Coastal Warfare.			
	FY 2008	FY 2009	FY 2010
9B57A Carrier Plant Automation and Manning Reduction Technology Insertion	0.771	0.000	0.000
RDT&E Articles Quantity	0	0	0
To enable the proliferation of non-tactical technologies, solution, applications, and systems from submarine propulsion plants into aircraft carrier nuclear propulsion plants. This effort will ensure that open architecture, open standards software and network design is used in carriers as well as submarines to ensure one life-cycle supportable system is fielded. Efforts include PPKM pilot installation and ongoing shipboard maintenance solution requirements and design work.			
	FY 2008	FY 2009	FY 2010
9B58A Improved Corrosion Protection for Electromagnetic Aircraft Launch System	1.928	1.995	0.000
RDT&E Articles Quantity	0	0	0
Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in NJ. Various coupons and coating have been exposed up to 7 months now and will continue to be evaluated up to 3 years of exposure under simulated flight deck trough conditions. The funding will also be used to initiate a phase 2 study into the development of a corrosion inhibitor addition to the armature cooling to extend the armature's life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled under the unique conditions of the EMALS trough for in-service support of the EMALS system.			
	FY 2008	FY 2009	FY 2010
9D23A National Sensor Fusion Support for Puget Sound Port Authority	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0
Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the AN/UJQ-100, has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks			

CLASSIFICATION:		UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603512N/CARRIER SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 9999/CONGRESSIONAL ADDS	
and to provide military commanders with the CTP they need to support critical battlespace decisions. The NSF for PSPS is being developed as an application within the Service Oriented Architecture (SOA) of the Undersea Warfare - Decision Support System (USW-DSS) (AN/UYQ-100).			
	FY 2008	FY 2009	FY 2010
9D24A EMALS	0.000	23.934	0.000
RDT&E Articles Quantity	0	0	0
Funding will be used to support additional scope of work resulting from complex ship integration, a re-planned Test and Evaluation Program to reduce risks for CVN 78, incorporation of the Production Assessment Review findings and the escalated costs of steel, copper and other materials. Additionally, the funding supported resolution of technical problems associated with Factory Acceptance Testing of the Power Conversion Subsystem, the Prime Power Interface Subsystem and Motor-Generator #4. The associated impacts caused test start delays for High Cycle Test Phase II and Highly Accelerated Life Testing.			